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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/421,575	10/20/1999	ICHIRO KASAI	15162/00910	4346

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EXAMINER

CURTIS, CRAIG

ART UNIT

PAPER NUMBER

2872

DATE MAILED: 06/04/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.
09/421,575

Applicant(s)
KASAI

Examiner
Craig Curtis

Art Unit
2872



The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on Mar 14, 2003
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above, claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 2-7 and 11-16 is/are allowed.
- 6) ☒ Claim(s) 1, 8-10, 17, and 18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some* c) ☐ None of:
- ☒ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- *See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s). _____ 6) ☐ Other: _____

Art Unit: 2872

DETAILED ACTION

Disposition of the Instant Application

- This Office action is responsive to Applicant's request for CPA, which has been made of record in the file as Paper No. 20.
- In the most-recent Amendment (i.e., Amendment C, filed on 6/24/02, prior to the final rejection mailed on 9/16/02), Applicant replaced claims 1, 2, 7, 10, 11, and 16; thus, claims 1-18 are currently pending in the application.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

- I. Claims 1 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wallace (5,355,224).

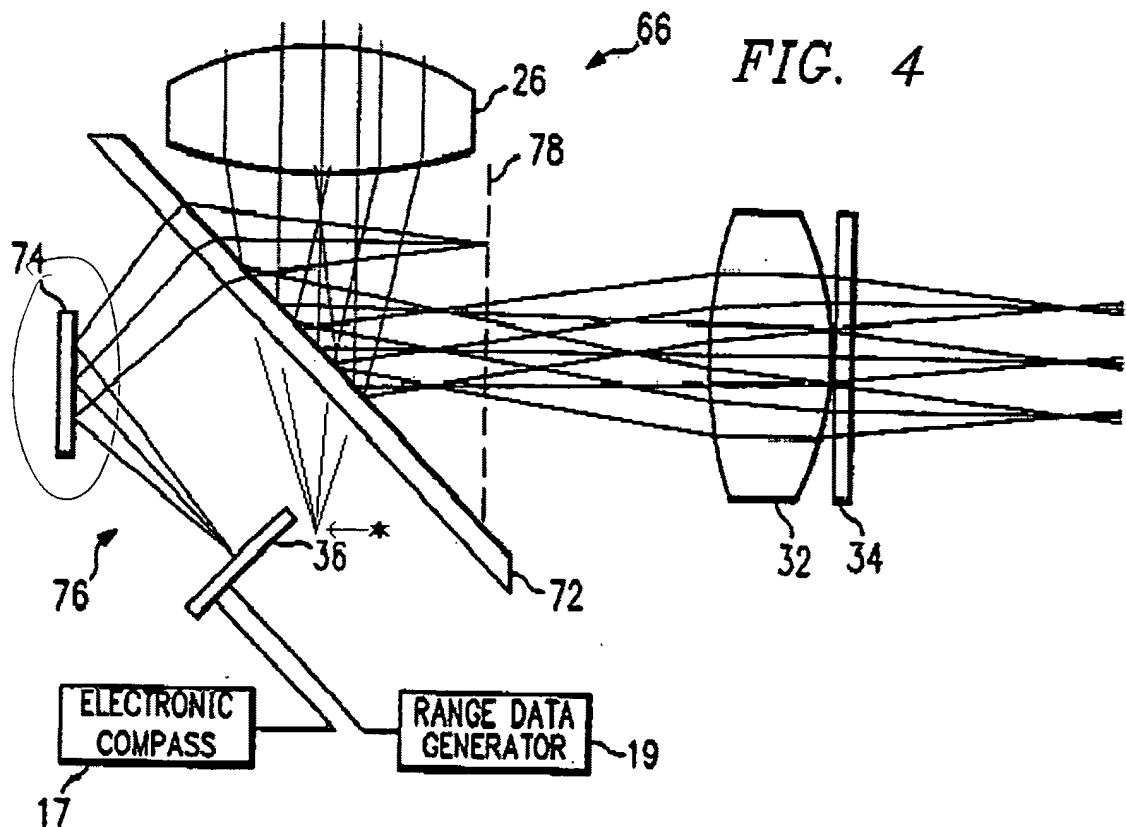
Wallace discloses the invention as claimed--a viewing optical system/optical apparatus a viewing optical system, said viewing optical system (Fig. 1A) comprising:

an objective system (13) for forming on an image surface an image of an object;

Art Unit: 2872

an eyepiece system (32) for enlarging and directing the image to a pupil;

a hologram combiner (Fig. 4, 72) comprising a reflective-type hologram (a reflective- *and* transmissive-type, or transflective-type, actually) and having an optical power for constructing an equivalent surface (78) which is optically equivalent to the image surface at a different position than the image surface as viewed from the pupil (See annotated Fig. 4 below: esp. <---*); and



Art Unit: 2872

an information display device (76) for displaying information on the equivalent surface--EXCEPT FOR the additional teaching wherein the hologram combiner transmits light from the image and reflects light from the information display device so that the image can be viewed with the information overlaid thereon. It is noted, however, that Wallace does disclose wherein the hologram combiner reflects light from the image and transmits light from the information display device so that the image can be viewed with the information overlaid thereon.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have assembled the system of Wallace such that the hologram combiner transmit light from the image and reflect light from the information display device so that the image could be viewed with the information overlaid thereon, such a geometry amounting to a straightforward rearrangement of existing parts, since it has been held that rearranging parts of an invention involves only routine skill in the art. In *re Japikse*, 181 F.2d 1019, 86 USPQ 70 (CCPA 1950). One would have been motivated to switch (read: rearrange) the relative positions of the information display device and light from the image (including, of course, lens 26), one to the other, for at least the purpose of, for the sake of example, increasing the brightness of light from the information display device via reflection from said hologram combiner, as opposed to the brightness of same realizable via transmission through said hologram combiner.

Art Unit: 2872

2. Claims 8, 9, 17, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wallace (5,355,224) in view of Swift (G.B. 2 123 974 A).

Wallace discloses the claimed invention as set forth above with respect to claims 1 and 10 EXCEPT FOR the additional explicit teachings wherein said viewing system is a reverse Galileo type optical system, which further comprises a relay lens for inverting the image.

Swift, however, teaches a viewing system of the reverse Galileo type (see abstract) and a relay lens (Fig. 1, lens 20). It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the viewing system of Wallace such that it be of the reverse Galileo type and have a relay lens, as taught by Swift, for at least the purpose of providing a wider field of view than would be possible in a system that wasn't reverse Galilean, as well as providing proper image parity via the provision of said relay lens.

Response to Arguments

3. Applicant's arguments filed 24 June 2002 have been fully considered but they are not persuasive. In addition to the Response to Arguments set forth in the outstanding Final Rejection (duplicated below), the Examiner would simply like to add that, with regard to independent claims 1 and 10, Wallace can fairly be viewed as meeting Applicant's recitation in these claims of, in pertinent part, "...a hologram combiner comprising a reflective type hologram and having an optical power for constructing an equivalent surface which is optically equivalent to the image surface at a different position than the image

Art Unit: 2872

surface as viewed from the pupil." That this is the case can be seen by reference to the annotated Fig. 4 of Wallace provided above. In this case, the equivalent surface is 78, and the image surface (virtual) is as depicted by "<---*." As clearly depicted, equivalent surface 78 is both optically equivalent to the image surface (identified by "<---*") and at a different position than the image surface as viewed from the pupil.

Applicant has respectfully traversed the rejection of claims 1 and 10 under 35 U.S.C. 103(a), as being unpatentable over Wallace (5,355,224), basing said traversal on the alleged non-teaching (by Wallace) wherein "the hologram combiner comprises a reflective type hologram and has an optical power for constructing an equivalent surface to an image surface, but at a different position than the image surface." The examiner respectfully disagrees.

As is clearly set forth in Fig. 4 of the Wallace reference, the hologram combiner (72) is both reflective and transmissive (read: transfective): reflecting the light from the image and transmitting the light from the information display device (76). As is clearly set forth in the rejection of claims 1 and 10 above, one of ordinary skill in the viewing optical system art would certainly consider the rearrangement of the relative positions of the information display device and light from the image (including, of course, lens 26), one to the other, for at least the purpose of, for the sake of example, increasing the brightness of light from the information display device via reflection from said hologram combiner, as opposed to the brightness of same realizable via transmission through said hologram combiner.

Applicant further traverses the rejection of claims 1 and 10 under 35 U.S.C. 103(a), as being unpatentable over Wallace (5,355,224), based on the alleged non-teaching by same of "a holographic

Art Unit: 2872

combiner...having an optical power for constructing an equivalent surface which is optically equivalent to the image surface at a different position than the image surface as viewed from the pupil." The examiner respectfully disagrees with this assertion.

The hologram combiner (72) taught by Wallace not only has optical power (as can clearly be seen in Fig. 4, in which light diverging from folding mirror (74)--that is, light from said image display device--is made to converge, following its transit through said hologram combiner, a result that could only be achieved if said hologram combiner had non-zero optical power), but focuses light from said information display device at plane 78, which is "optically equivalent" to the image surface at a different position than the image surface as viewed from the pupil in the same manner as that constructed by Applicant's hologram combiner. It is noted that the manner in which something can be described as being both "optically equivalent" and "at a different position than the image surface as viewed from the pupil" is met by Wallace by broadly interpreting "optically equivalent." In addition, as was noted in the previous Office action, Fig. 4 clearly depicts light from the information display device focussing at a different position (i.e., to the left of 78) than light from the imaging lens 26 (which focuses to the left of 78, denominated "common" or not) as viewed from the pupil (although the physical separation between focused information display device light and that from the imaging lens (read: image) is not set out in Wallace).

With regard to claims 8, 9, 17, and 18, Applicant's argument that Swift fails to suggest the use of a reflective-type hologram and, further, that it simply reinforces the teachings of Wallace as to the use of transmission-type holograms, is noted. Applicant is apprised, however, that the Swift reference was relied upon solely for its teaching of both a viewing system of the reverse Galileo type and a relay lens.

Art Unit: 2872

Moreover, the transfective nature of the hologram combiner (72) of Wallace has been addressed above in the rejection of claims 1 and 10, thereby rendering irrelevant Swift's teaching or non-teaching of a transmission vs. a reflection hologram, or vice versa.

Allowable Subject Matter

4. Claims 2-7, and 11-16 are allowed.

Reasons for Allowance

5. The following is an examiner's statement of reasons for allowance:

The claims are allowable over the prior art for at least the reason that the prior art fails to teach or reasonably suggest, with regard to claims 2-6, and 11-15, *a viewing optical system comprising, inter alia, a pentagonal prism for inverting the image, said pentagonal prism having a plurality of surfaces, said hologram combiner being disposed on one of said plurality of surfaces*; with regard to claims 7 and 16, *a viewing optical system comprising, inter alia, an inverting system comprising a first prism and a second prism arranged with a small space therebetween, the small space forming a TIR surface, the hologram combiner being disposed on a second prism side of said TIR surface*, as set forth in the claimed combination.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

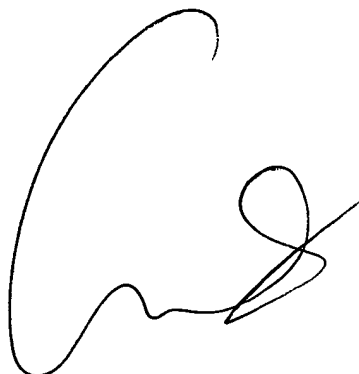
Art Unit: 2872

Contact Information

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Craig Curtis, whose telephone number is (703) 305-0776. The facsimile phone number for Art Unit 2872 is (703) 308-7721.

Any inquiry of a general nature regarding the status of this application should be directed to the Group receptionist, whose telephone number is (703) 308-0956.

Craig H. Curtis
Craig H. Curtis
Group Art Unit
28 May 2003

A handwritten signature in black ink, appearing to read 'Audrey Chang', with a large, sweeping initial 'A' and a stylized 'C'.

Audrey Chang
Primary Examiner
Technology Center 2800